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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/052,440	01/23/2002	Yoji Ito	030662-081	1948

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EXAMINER

HON, SOW FUN

ART UNIT	PAPER NUMBER
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1772

DATE MAILED: 12/19/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/052,440

Applicant(s)

ITO, YOJI

Examiner

Sow-Fun Hon

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-15 is/are pending in the application.
- 4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 1-15 is/are rejected.
- 7) ☐ Claim(s) ____ is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on ____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. §§ 119 and 120

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. ____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 13) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application) since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.
- a) ☐ The translation of the foreign language provisional application has been received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121 since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 3.
- 4) ☐ Interview Summary (PTO-413) Paper No(s). ____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____

DETAILED ACTION

Claim Rejections - 35 USC § 102

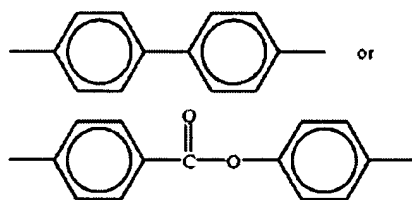
1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

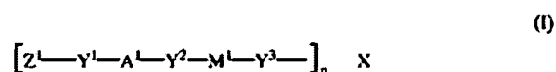
2. Claims 1-4 are rejected under 35 U.S.C. 102(b) as being anticipated by Schumacher et al. (US 6,410,130), as defined by Applicant's specification.

Schumacher et al. has a sheet (layer on a substrate) comprising a transparent support (since the cellulose (tri)acetate layer substrate) (column 40, line 4) is listed in Applicant's specification (disclosure, page 14, lines 15-20) and a cholesteric layer which is optically anisotropic (since the biphenyl and benzoic ester mesogens) (column 23, lines 25-40) are listed in Applicant's specification (disclosure, page 38, lines 1-5). The biphenyl and benzoic ester mesogens are shown below:



The optically anisotropic layer is formed from liquid crystal molecules and monomers having four or more double bonds. The basic structure of the liquid crystal molecule of Schumacher et al. is shown on the next page.

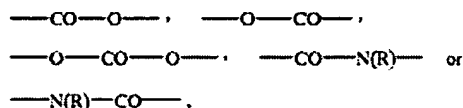
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where

Z^1 is a polymerizable group or a radical which carries a polymerizable group,

Y^1, Y^2, Y^3 independently are chemical bonds, oxygen, sulfur,



A^1 is a spacer,

M^1 is a mesogenic group,

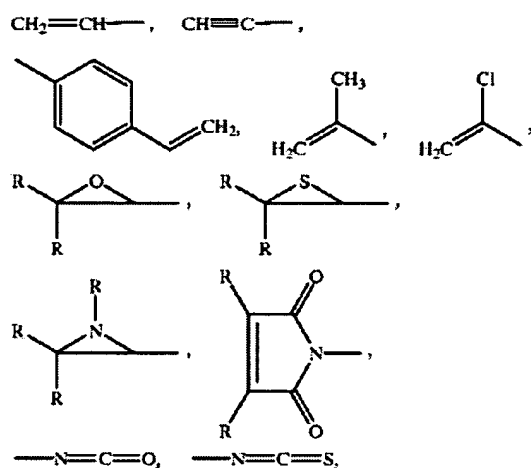
X is an n-valent chiral radical,

R is hydrogen or C_1 - C_4 -alkyl,

n is 1 to 6,

and Z^1, Y^1, Y^2, Y^3, A^1 and M^1 can be identical or different if n is greater than 1.

Preferred radicals Z^1 are:



The liquid crystal molecule of Schumacher et al. can have up to $n=6$ of Z^1 crosslinkable $\text{CH}_2=\text{CH-}$ double bonds as can be seen above, and up to $3(n=6) = 18$ for the allylic benzene radical on the line below the $\text{CH}_2=\text{CH-}$ radical.

The crosslinkable monomer is an ester of a polyol having four hydroxyl groups with an acrylic acid or a methacrylic acid and is defined in Applicant's specification

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(Applicant's disclosure, page 12, lines 15-25) as including the tetra(meth)acrylates of pentaerythritol (column 44, lines 30-40) having four crosslinkable double bonds. The tetraacrylate monomer is added in the amount of 5 % by weight of the total mixture (column 35, lines 55-65), which is within the claimed range of 0.1 to 50 wt %. The liquid crystal and monomer are crosslinked to form the solid anisotropic (cholesteric) layer (column 5, line 40).

The combination of the anisotropic layer and transparent support is defined as the optical compensatory sheet in Applicant's specification (disclosure, page 5, lines 15-25).

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

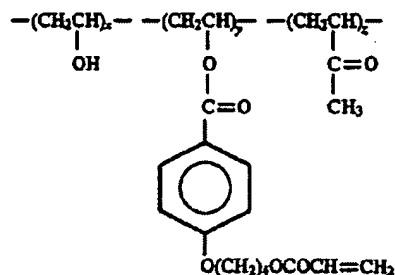
4. Claims 5-8 are rejected under 35 U.S.C. 103(a) as being unpatentable over Schumacher et al. in view of Okazaki et al. (US 5,747,121).

Schumacher et al. has been discussed above and teaches the optical compensatory sheet comprising a transparent cellulose acetate support and an optically anisotropic layer formed from liquid crystal molecules and monomers having four or more double bonds, said monomers being polymerized to form a crosslinked polymer in the optically anisotropic layer. Schumacher et al. teaches that the compensatory sheet can achieve a host of reflection wavelengths, UV, IR and visible (column 46, lines 35-40).

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Schumacher et al. fails to teach the orientation layer, and that the liquid crystal is discotic.

Okazaki et al. teaches an optical compensatory sheet comprising a transparent support layer, an optically anisotropic layer and an orientation layer. The optically anisotropic layer comprises liquid crystal molecules which are discotic (column 5, lines 15-20). The orientation layer comprises a polymer having double bonds at side chains as shown below (column 21, lines 15-25):



Okazaki et al. teaches that the polymer in the orientation layer and the monomers in the optically anisotropic layer are copolymerized along an interface between the orientation layer and the optically anisotropic layer (chemical bonding via the interface of the two layers by reacting the polymerizable group of orienting polymer with a polymerizable group of the liquid crystalline compound (column 7, lines 1-10).

Schumacher et al. teaches that the compensatory sheet which comprises the anisotropic layer of crosslinked liquid crystal and monomer with four double bonds or more, and the cellulose acetate transparent support, can achieve a host of reflection wavelengths, UV, IR and visible (column 46, lines 35-40). Therefore it would have been obvious to one of ordinary skill in the art to have combined the anisotropic layer of

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Schumacher et al. with the anisotropic layer of Okazaki et al., in order to obtain an anisotropic layer comprising crosslinked and copolymerized discotic liquid crystal molecules and monomers, with four or more double bonds, which can achieve the desired wavelength retardation and compensation.

5. Claims 9-15 are rejected under 35 U.S.C. 103(a) as being unpatentable over Schumacher et al. in view of Aminaka (US 6,476,892).

Schumacher et al. has been discussed above and teaches the optical compensatory sheet comprising a transparent cellulose acetate support and an optically anisotropic layer formed from liquid crystal molecules and monomers having four or more double bonds, said monomers being polymerized to form a crosslinked polymer in the optically anisotropic layer. Schumacher et al. teaches that the compensatory sheet can achieve a host of reflection wavelengths, UV, IR and visible (column 46, lines 35-40).

Schumacher et al. fails to teach that the optical compensatory sheet is used in a liquid crystal display, and fails to disclose the retardation properties of the cellulose acetate transparent support.

Aminaka has a liquid crystal display comprising two polarizing plates, a liquid crystal cell provided between the two plates, and at least one optical compensatory sheet placed between the cell and at least one of the plates (column 11, lines 45-55). The cellulose acetate film functions as a transparent protective film of the polarizing plate (column 11, lines 60-65).

Aminaka teaches that the cellulose acetate film has a retardation value in plane, R_e , of 20 to 70 nm, which overlaps the claimed range of 0 to 50 nm, and a retardation value along a thickness direction, R_{th} , with the claimed range of 70 to 400 nm (column 1,

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lines 55-65). The cellulose acetate film has an acetic acid content with the claimed range of 59.0 to 61.5% (column 1, lines 65-70), and contains an aromatic compound having two or more aromatic rings in the claimed amount of 0.01 to 20 weight parts based on 100 weight parts of cellulose acetate (column 2, lines 1-10).

Aminaka teaches that the cellulose acetate film is formed from a solution of cellulose acetate in a solvent selected from a group consisting of an ether having 2 to 12 carbons atoms, a ketone having 2 to 12 carbon atoms or an ester having 2 to 12 carbon atoms ((column 7, lines 40-50). Casting two or more cellulose acetate solutions simultaneously increases the efficiency of the film production process.

Schumacher et al. teaches that the compensatory sheet which comprises the layer of crosslinked liquid crystal and monomer with four double bonds or more, and the cellulose acetate transparent support, can achieve a host of reflection wavelengths, UV, IR and visible (column 46, lines 35-40). Thus it would have been obvious to one of ordinary skill in the art to combine the compensatory sheet of Schumacher et al. with the compensatory sheet of Aminaka, in order to obtain a liquid crystal display with the desired light phase retardation and compensation.

Any inquiry concerning this communication should be directed to Sow-Fun Hon whose telephone number is (703)308-3265. The examiner can normally be reached Monday to Friday from 9:00 AM to 6:00 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Harold Pyon, can be reached on (703)308-4251. The fax phone number for the organization where this application or proceeding is assigned is (703)872-9310.

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Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703)308-0661.

SH

Sow-Fun Hon

12/12/03



HAROLD PYON
SUPERVISORY PATENT EXAMINER

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12/15/03